

Principles of Veterinary Science

Principles of Veterinary Science challenges students to use advanced technologies and medical treatments to maintain the health of animals. The animal health industry continues to grow in importance and prominence as more people purchase animals for pleasure and sustenance. This course addresses standard principles of veterinarian medicine and includes new methods of treatment that will be used as we move into the 21st century.

Pre-requisites: Any two courses in the Animal Science Sub-cluster

Recommended Credit: 1

Recommended Grade Levels: 11th or 12th

* All learning expectations must be met for the 1 credit in this course.

Principles of Veterinary Science

Standard 1.0

The student will analyze how diseases affect the animal's body and how they are diagnosed.

Standard 2.0

The student will analyze vaccines and their role in animal health.

Standard 3.0

The student will evaluate the use of animal health products.

Standard 4.0

The student will assess laws and regulations involving animal disease and animal wellbeing.

Standard 5.0

The student will evaluate the principles of disease control in animals.

Standard 6.0

The student will examine diseases of common animals seen in the local area.

Standard 7.0

The student will examine basic surgery procedures.

Standard 8.0

The student will evaluate educational requirements, job descriptions and salaries associated with careers in Veterinary Science.

Standard 9.0

The student will integrate academic competencies in veterinary science.

Standard 10.0

The student will develop premier leadership and personal growth needed for a career in veterinary science.

Principles of Veterinary Science

Course Description:

The advanced standards in this course will familiarize students with competencies required in a veterinary science career. This course is the advanced course of the animal science sub-cluster and prepares students to work in a laboratory environment dealing with animal health.

Standard 1.0

The student will analyze how diseases affect the animal's body and how they are diagnosed.

Learning Expectations:

The student will:

- 1.1 Relate the concepts of animal disease to human diseases.
- 1.2 Evaluate the impact of animal disease on animals, humans and society.
- 1.3 Examine the factors that make the animal more susceptible to disease.
- 1.4 Evaluate the classifications of diseases and how the body responds to them.

Evidence Standard is met:

The student will:

- Determine the economic impact animal diseases have on animal, human and societal welfare.
- Specify factors that make animals susceptible to disease.
- Prepare the classifications of diseases based on environmental conditions.

Integration/Linkages

Biology, Social Studies, Anatomy and Physiology, Health Sciences, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Evaluate the symptoms of a disease seen in animals under the care of a veterinarian.
- Perform a simple physical examination of an animal.
- Specify behaviors seen in animals that are ill.
- Evaluate the effects of a specific disease on an animal.
- Divide into pairs and interview one another regarding the history of an animal with a hypothetical disease.

Standard 2.0

The student will analyze vaccines and their role in animal health.

Learning Expectations:

The student will:

- 2.1 Evaluate the use of different types of vaccines.
- 2.2 Assess how vaccines produce immunity and why they may fail.
- 2.3 Evaluate safety procedures to be used when administering vaccines.

Evidence Standard is Met:

The student will:

- Recommend a vaccine based on a given animal illness.
- Evaluate the effects of a vaccine on an animal.
- Demonstrate how to correctly administer vaccines.

Integration/Linkages

Language Arts, Health Science, Biology, Chemistry, Anatomy and Physiology, OSHA Standards, TOSHA Standards, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Determine the role of vaccines in disease prevention.
- Present ways to manufacture and test vaccines.
- Prepare a portfolio of various vaccines available for use.
- Demonstrate the proper administration of vaccines by subcutaneous or intra-muscular vaccines.

- Present information on a particular vaccine, its use and precautions for use.
- Present a vaccination program for the animal of your choice.

Standard 3.0

The student will evaluate the use of animal health products.

Learning Expectations:

The student will:

- 3.1 Compare the classes of animal health products, what they do, and how they are manufactured.
- 3.2 Evaluate regulations involving animal health products and their use.
- 3.3 Evaluate procedures for administering animal health products.

Evidence Standard is Met:

The student will:

- Recommend animal health products for specific problems in livestock.
- Analyze the effects government regulations have on the animal health industry.
- Calculate dosages of animal health products based on product label information.
- Demonstrate the appropriate use of animal health products.

Integration/Linkages

Mathematics, Biology, Chemistry, Health Science, Social Studies, Ecology, OSHA Standards, TOSHA Standards, EPA Regulations, Language Arts, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Organize a portfolio of animal health products and their uses.
- Demonstrate proper administration of animal health products by intra-muscular or subcutaneous injection.
- Calculate the dosage of an animal health product for a specific animal.
- Debate issues related to the use of growth promoting implants in cattle, including economic advantages and disadvantages.

Standard 4.0

The student will assess laws and regulations involving animal disease and animal wellbeing.

Learning Expectations:

The student will:

- 4.1 Assess the federal licensure of animal health products.
- 4.2 Analyze the USDA's roles in disease control.
- 4.3 Evaluate the role of state veterinarians, state animal disease laws and diagnostic labs in animal disease control.
- 4.4 Examine state and local humane laws.

Evidence Standard is Met:

The student will:

- Compare current licensure methods to those used in the past.
- Examine the efforts of the USDA in controlling animal diseases.
- Measure the effectiveness of veterinarians and labs in controlling animal diseases.
- Propose laws that should be implemented for the control and raising of animals.

Integration/Linkages

Language Arts, Government, Social Studies, EPA Regulations, OSHA Standards, TOSHA Standards, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Present information gained from visiting a local humane society.
- Obtain a Certificate of Veterinary Inspection and describe the testing necessary to legally transport an animal from your county to the state of Nebraska.
- Visit a local livestock sale barn and report on animal disease testing there.
- Prepare a presentation on a disease of animals that occurs in other countries but not in the U.S.
- Perform a simple test to detect antibiotic residues in milk.

Standard 5.0

The student will evaluate the principles of disease control in animals.

Learning Expectations:

The student will:

- 5.1 Evaluate the importance of sanitation and disinfection on animal health.
- 5.2 Appraise the value of biosecurity and isolation to an animal's health.
- 5.3 Evaluate housing needs for a species of livestock.
- 5.4 Explore the nutritional value of different feeds.
- 5.5 Analyze the use of vaccines for preventive medicine.
- 5.6 Prepare an accurate diagnosis and early treatment for animal disease.

Evidence Standard is Met:

The student will:

- Design an animal facility that meets the sanitation and housing requirements for livestock.
- Calculate appropriate feeds for animals, based on local farm commodities.
- Recommend vaccines based on an animal's diagnosis.
- Present a preventive maintenance schedule to maintain an animal's health.

Integration/Linkages

Biology, Drafting, Health Sciences, Mathematics, Language Arts, Chemistry, Ecology, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Design a biosecurity system for a local farm.
- Using hypochlorite and a plastic bowl, demonstrate proper disinfection.
- Collect disinfectants appropriate for use around animal premises.
- Evaluate the problem of equine infectious anemia and the role of the Coggins test in its control.
- Determine how the ration of a cow with milk fever or a cat with panintitis should be changed to prevent these diseases.
- Test animals for possible diseases.

Standard 6.0

The student will examine diseases of common animals seen in their area.

Learning Expectations:

The student will:

- 6.1 Examine diseases seen in dogs, cats, horses, cows, pigs, sheep, and goats.
- 6.2 Differentiate degenerative, anomalous, metabolic, neoplastic, infectious and traumatic diseases.
- 6.3 Analyze diseases of animals that affect humans.
- 6.4 Evaluate a disease that is important in the world but does not occur in the U.S.

Evidence Standard is Met:

The student will:

- Compare different diseases that affect various animals.
- Contrast the effects different categories of diseases have on animals.
- Evaluate the effects of an animal disease on humans.
- Debate the importance of researching a disease that affects other parts of the world but not the U.S.

Integration/Linkages

Social Studies, Language Arts, Biology, Chemistry, Health Sciences, Biotechnology, Geography, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Evaluate a sample case study regarding animal diseases.
- Interview a veterinarian to determine the seriousness of diseases seen in a veterinarian's office.
- Present a schedule of preventive medicine on a disease that commonly affects the animal of your choice.
- Using current technology resources, examine the effects animal diseases can have on the human population.

Standard 7.0

The student will demonstrate the principles of surgery.

Learning Expectations

The student will:

- 7.1 Examine the causes of sterility in animals.
- 7.2 Compare the uses of anesthetics and analgesics.
- 7.3 Assess the efficiency of the healing process.

Evidence Standard is Met:

The student will:

- Predict an animal's sterility based on physical conditions.
- Determine the appropriate situations for using anesthetics and analgesics.
- Propose correct methods for ensuring the healing process for an animal.

Integration/Linkages

Health Education, Language Arts, Biology, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Present methods for spaying an animal.
- Demonstrate a simple suture pattern, using pillows and the assistance of a local veterinarian technician.
- Illustrate common animal surgeries completed in a veterinarian's office.
- Splint or cast a 2 x 4, using materials from a local hospital.

Standard 8.0

The student will evaluate educational requirements, job descriptions and salaries associated with careers in Veterinary Science.

Learning Expectation

The student will:

- 8.1 Examine skills and certifications needed for veterinarians.
- 8.2 Examine skills and certifications needed for careers in the animal health product area.
- 8.3 Evaluate personal skills needed to be successful in the animal science career area.
- 8.4 Compare the advantages and disadvantages of different careers in animal science.

Evidence Standard is Met:

The student will:

- Determine skills needed by a veterinarian to establish a successful practice.
- Assess the effectiveness of various educational programs in preparing students in animal science.
- Demonstrate ethics and personal relationship skills needed in the livestock industry.
- Propose possible career choices in animal science based on the aspects of the career.

Integration/Linkages

Language Arts, Health Sciences, Social Studies, National FFA Code of Ethics, Livestock Industry Standards, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Present information on the requirements for a career in animal science.
- Present information on educational requirements for Veterinary technicians.
- Present educational requirements for graduation from a post-secondary school with a science and technology concentration.
- Present a schedule for completing the degree requirements in a veterinarian school program.

Standard 9.0

The student will integrate academic competencies in veterinary science.

Language Arts:

The student will:

- 9.1 Construct and use spreadsheets and databases to record medical schedules for animals.
- 9.2 Complete technical forms used in a veterinarian's office.
- 9.3 Present information on the use of animal health products.
- 9.4 Use current technology to research information on animal diseases and health products.

Mathematics:

The student will:

- 9.5 Use English and metric units of measurement to calculate correct dosages of animal health products.
- 9.6 Read and construct graphs on animal growth and healing processes.

Science:

The student will:

- 9.7 Analyze an animal's gross anatomy.
- 9.8 Diagram an animal's physiology.
- 9.9 Evaluate the importance of an animal's nutrition.
- 9.10 Perform diagnosis of animal health using the scientific method.
- 9.11 Use nomenclature classification to categorize animal diseases and parasites.

Evidence Standard is Met:

The student will:

- Evaluate the causes of an animal's illness.
- Propose treatment for various animal health problems.
- Compare methods of treatment for animal health problems.
- Perform basic physical operations on an animal.
- Analyze post-secondary preparation programs in animal science.

Integration/Linkages

Language Arts, Mathematics, Biology, Chemistry, Social Studies, Health Sciences, SCANS (Secretary's Commission on Achieving Necessary Skills)

Sample Performance Tasks

- Demonstrate methods of disease treatment for an animal.
- Illustrate physical exams of animals.
- Compare animal science educational opportunities.
- Differentiate between medicines used for treating disease.

Standard 10.0

The student will develop premier leadership and personal growth needed for a career in veterinary science.

Learning Expectations:

The student will:

- 10.1 Demonstrate public speaking skills.
- 10.2 Demonstrate methods and techniques of parliamentary procedure.
- 10.3 Conduct and facilitate group discussions and planning committees.
- 10.4 Implement a program of activities for an organization.
- 10.5 Propose an SAEP, supervised agricultural experience program, related to animal science.

Evidence Standard is Met:

The student will:

- Interpret the rules regarding FFA public speaking CDE's.
- Employ appropriate parliamentary procedure abilities in a mock meeting.
- Complete records on a mock SAEP related to livestock management.
- Prepare a program of activities to include youth livestock events.

Integration/Linkages

National FFA Guidelines for Parliamentary Procedure, National FFA Guidelines for Public Speaking, Language Arts, Social Studies, SCANS (Secretary's Commission on Achieving Necessary Skills), National FFA Guidelines for Community Education Programs

Sample Performance Tasks

- Prepare a four-to-six-minute prepared or extemporaneous speech on a livestock topic.
- Create a mock meeting using twelve FFA parliamentary procedure abilities.
- Prepare an FFA proficiency award based on a mock livestock SAEP.
- Prepare a schedule of school and community livestock activities for chapter officers and members.
- Participate in the FFA Food for America program.
- Participate in the FFA Farm Safety Just 4 Kids program.
- Participate in the America Reads Challenge program.
- Participate in the FFA Partners for a Safer Community program.
- Participate in the FFA PALS program.